

VETERINARY PUBLIC HEALTH

Director, Zoonotic and Environmental Epidemiology

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March 30, 2011

Epidemiology Resource Center



Indiana State
Department of Health

Mosquito-Borne Disease

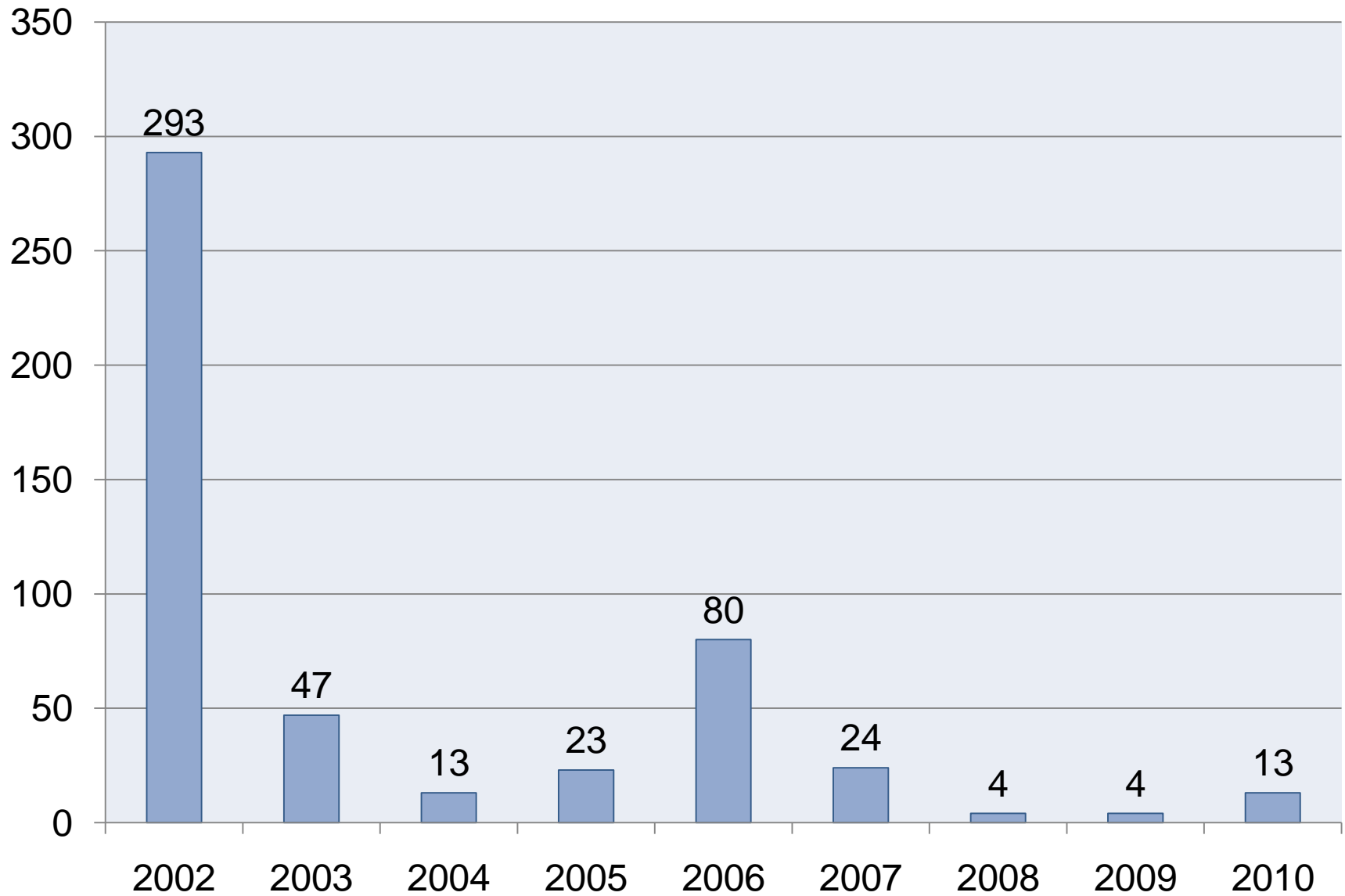
- Arbo-Viral Encephalitis
 - West Nile Virus
 - Eastern Equine Encephalitis
 - Saint Louis Encephalitis
 - California Encephalitis (Lacrosse)
 - Dengue

West Nile Virus

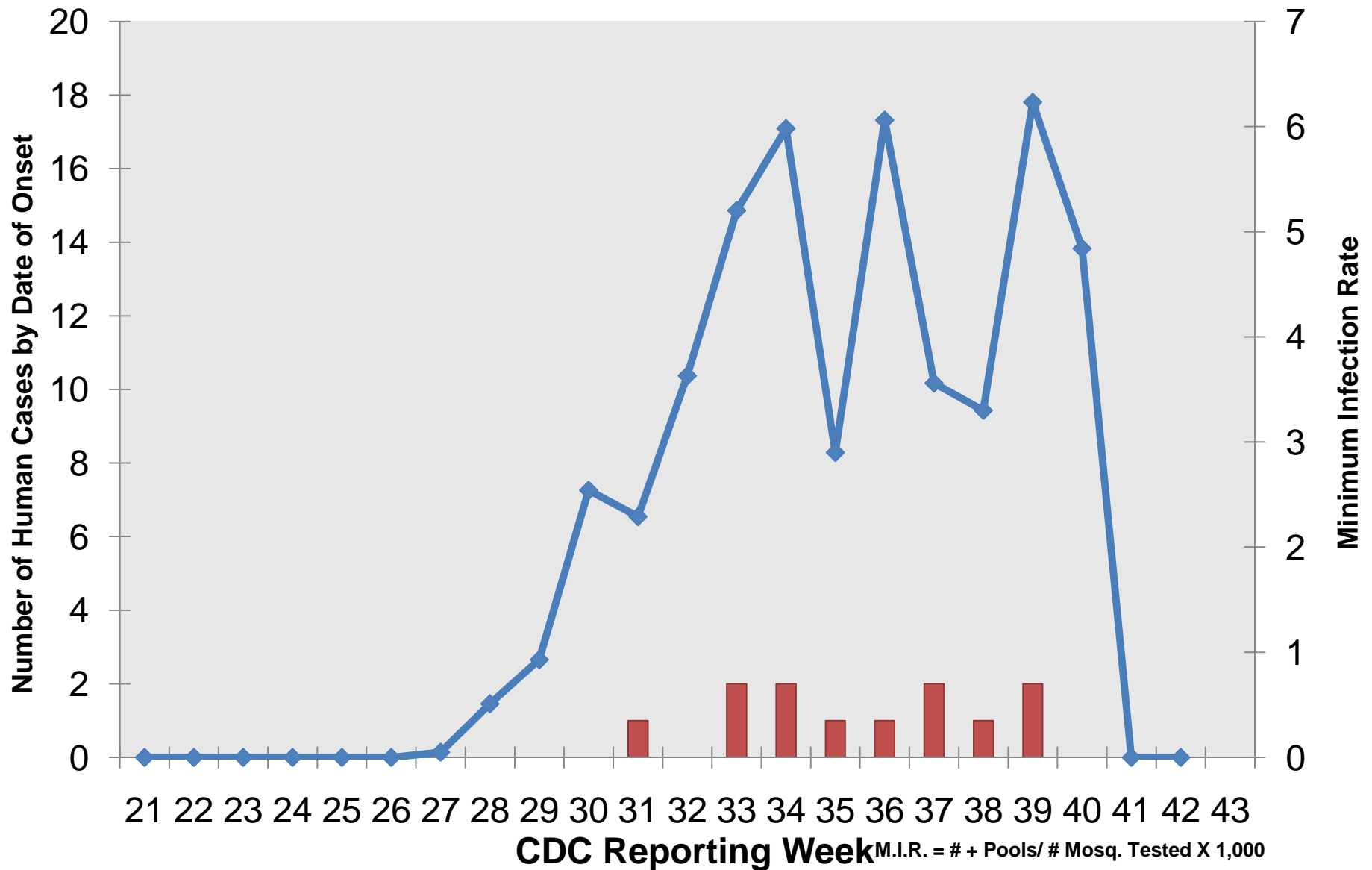
West Nile Virus in the US

- 1999 – 1 state - 62 cases
- 2000 – 3 states - 21 cases
- 2001 – 10 states - 66 cases
- 2002 – 39 states - 4156 cases
- 2003 – 45 states - 9858 cases
- 2004 – 41 states – 2231 cases
- 2005 – 42 states – 2819 cases
- 2006 – 44 states – 4269 cases
- 2007 – 43 states – 3630 cases
- 2008 – 43 states – 1338 cases
- 2009 – 34 states – 720 cases
- 2010 -- 39 States – 981 cases

Reported Cases of WNV-Indiana



Mosquito Infection Rates and Cases, 2010



North: Lee Green

317-517-5843

legreen@isdh.in.gov

Central: Bryan Price

317-694-2532

bprice@isdh.in.gov

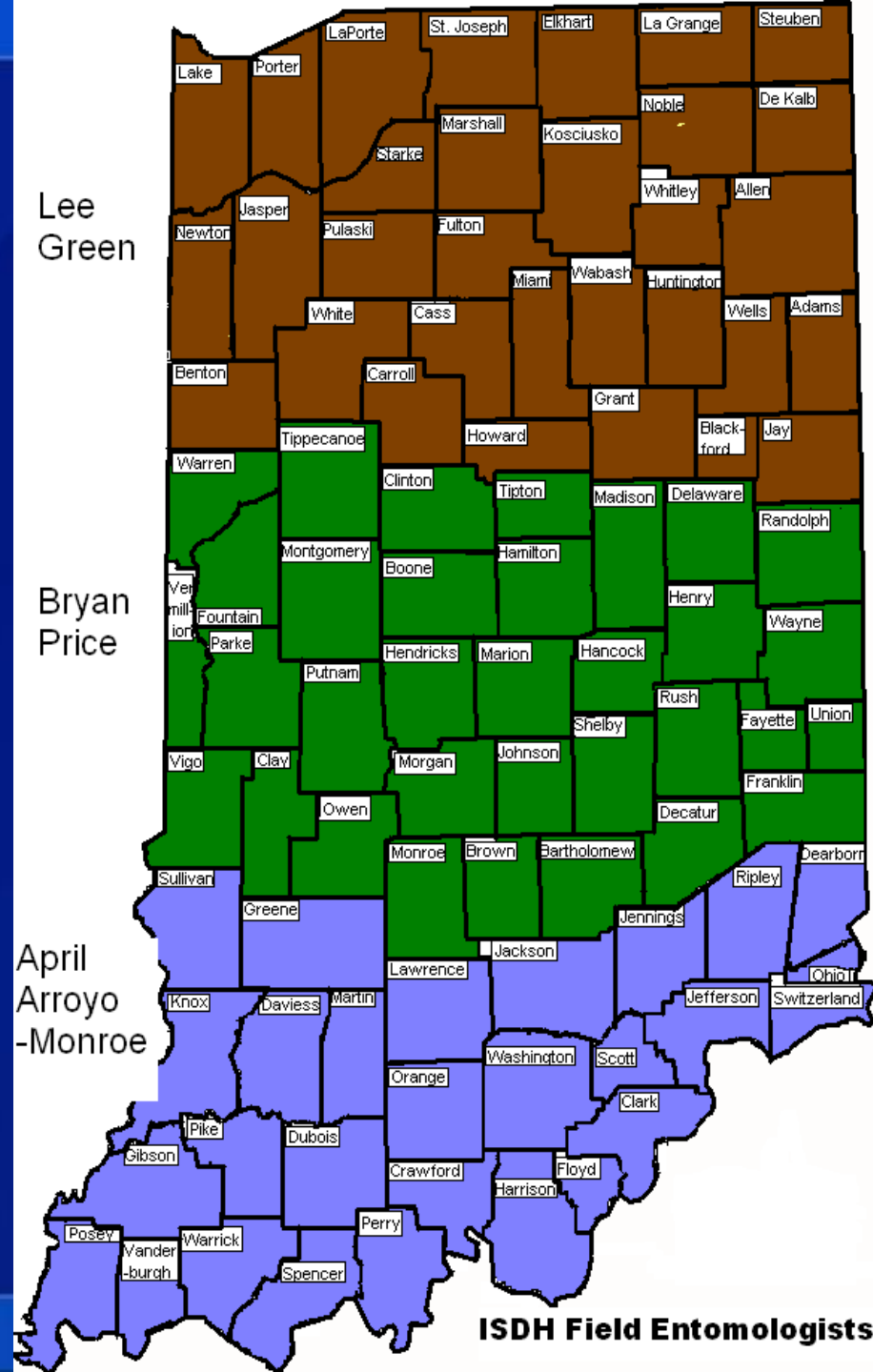
South: April Arroyo-Monroe

317-501-6349

aaroyo-monroe@isdh.in.gov

Main Office (Indianapolis)

317-351-7190





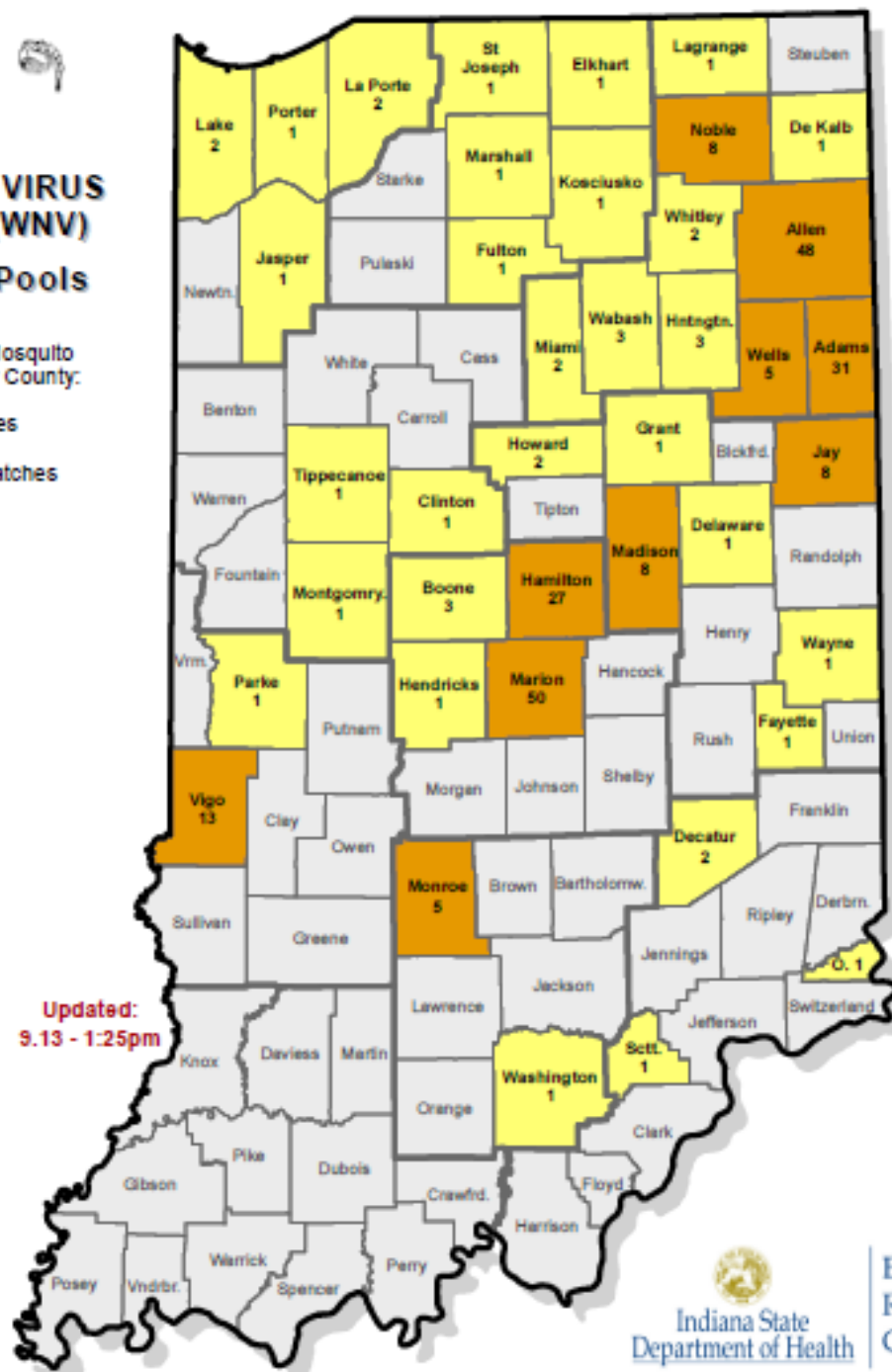
2010 WEST NILE VIRUS ACTIVITY (WNV)

Mosquito Pools

Lab-Confirmed Mosquito
WNV Batches by County:

1 to 4 batches

5 or more batches



Updated:
9.13 - 1:25pm



2010
WEST NILE VIRUS
ACTIVITY (WNV)

Human Cases

Lab-Confirmed Human
Cases by County:

- 1 to 4 human cases
- 5 or more human cases



Update Time:
2.3 - 12:10pm

Indiana Human West Nile Cases

2002 – 293

2003 – 48

2004 – 14

2005 – 16

2006 – 80

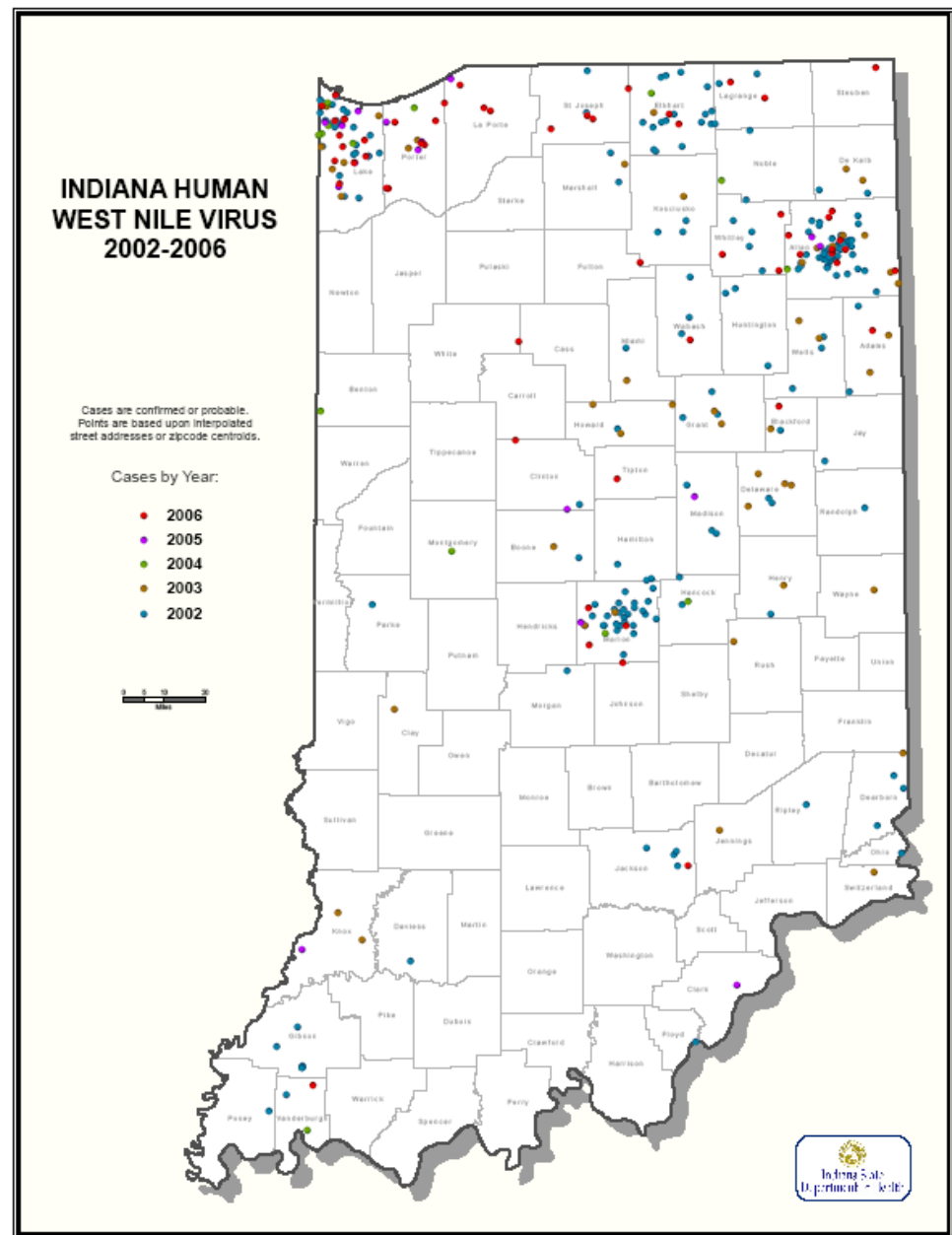
2007 – 24

2008 – 4

2009 – 4

2010 – 13 (not on map)

Total - 496





2010
WEST NILE VIRUS
ACTIVITY (WNV)

Equine Cases

Lab-Confirmed Equine
Cases by County:

1 to 4 equine cases

5 or more equine cases

Update Time:
2.3 - 12:10pm




Eastern Equine Encephalitis



2010 EASTERN EQUINE ENCEPHALOMYELITIS ACTIVITY (EEE)

Mosquito Pools

Lab-Confirmed Mosquito
EEE Batches by County:

 1 or more batches

Updated:
9.13 - 1:25pm





2010
EASTERN EQUINE
ENCEPHALOMYELITIS
ACTIVITY (EEE)

Equine Cases

Lab-Confirmed Equine
EEE Cases by County:

1 or more cases



Update Time:
2.3 - 12:10pm

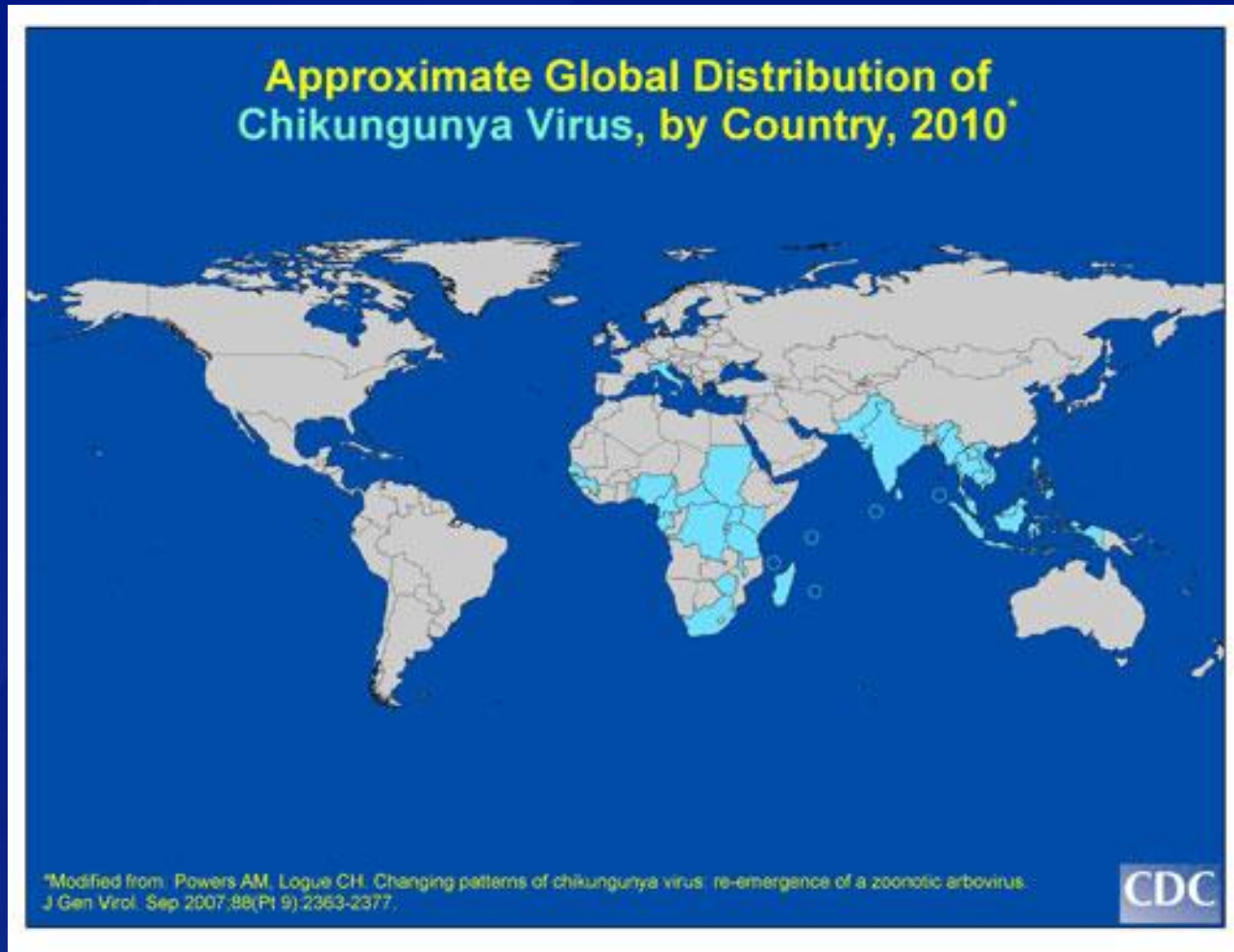
St. Louis Encephalitis

Lacrosse Encephalitis

Dengue



Chikungunya



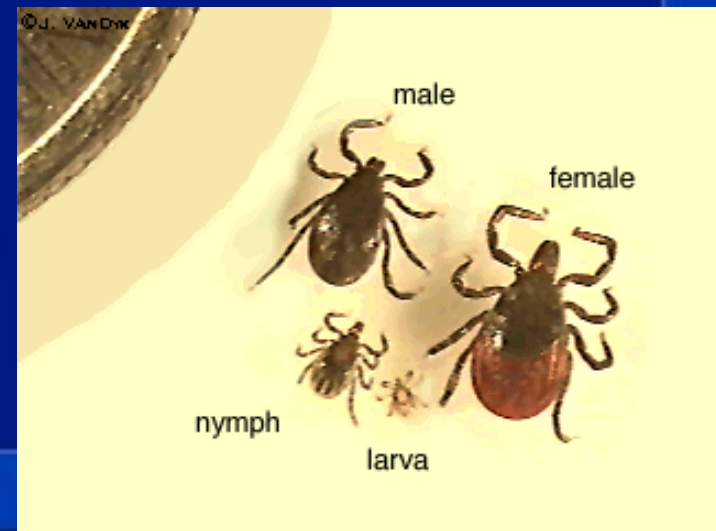
Tick-borne Diseases

- Lyme
- Rickettsiosis (Spotted Fever)
- Ehrlichiosis
- Babesiosis
- Tularemia
- Q-Fever



Lyme

- www.cdc.gov/Lyme
- <http://www.cdnetwork.org/NewCDN/LibraryView.aspx?ID=cdn552a>



Spotted Fever Rickettsiosis

- Rocky Mountain Spotted Fever
- Other Rickettsia
- http://www.cdc.gov/ticks/diseases/other_spotted_fever/faq.html



Ehrlichiosis

- <http://www.cdc.gov/ehrlichiosis/>

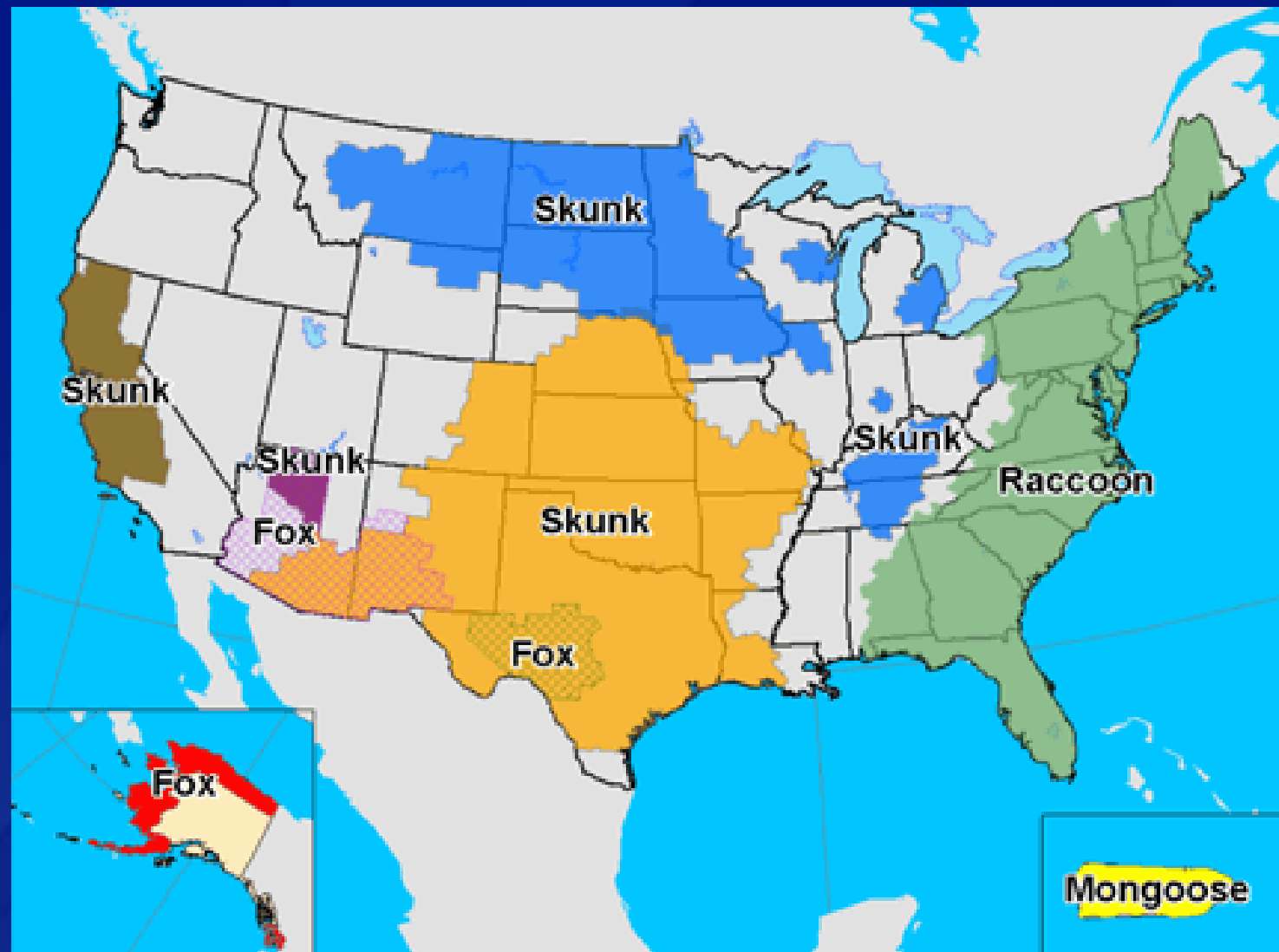


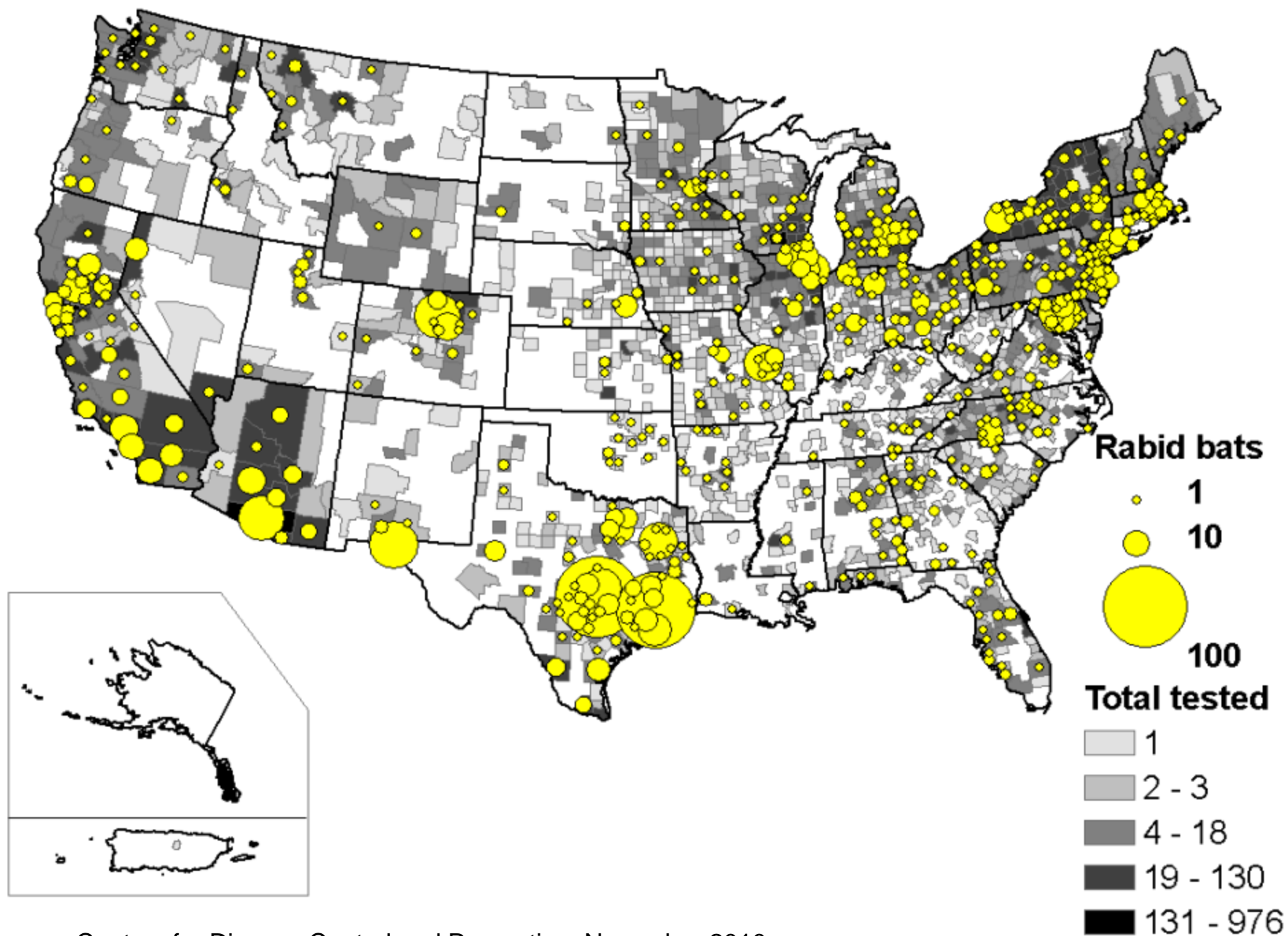
- <http://www.cdc.gov/anaplasmosis/>



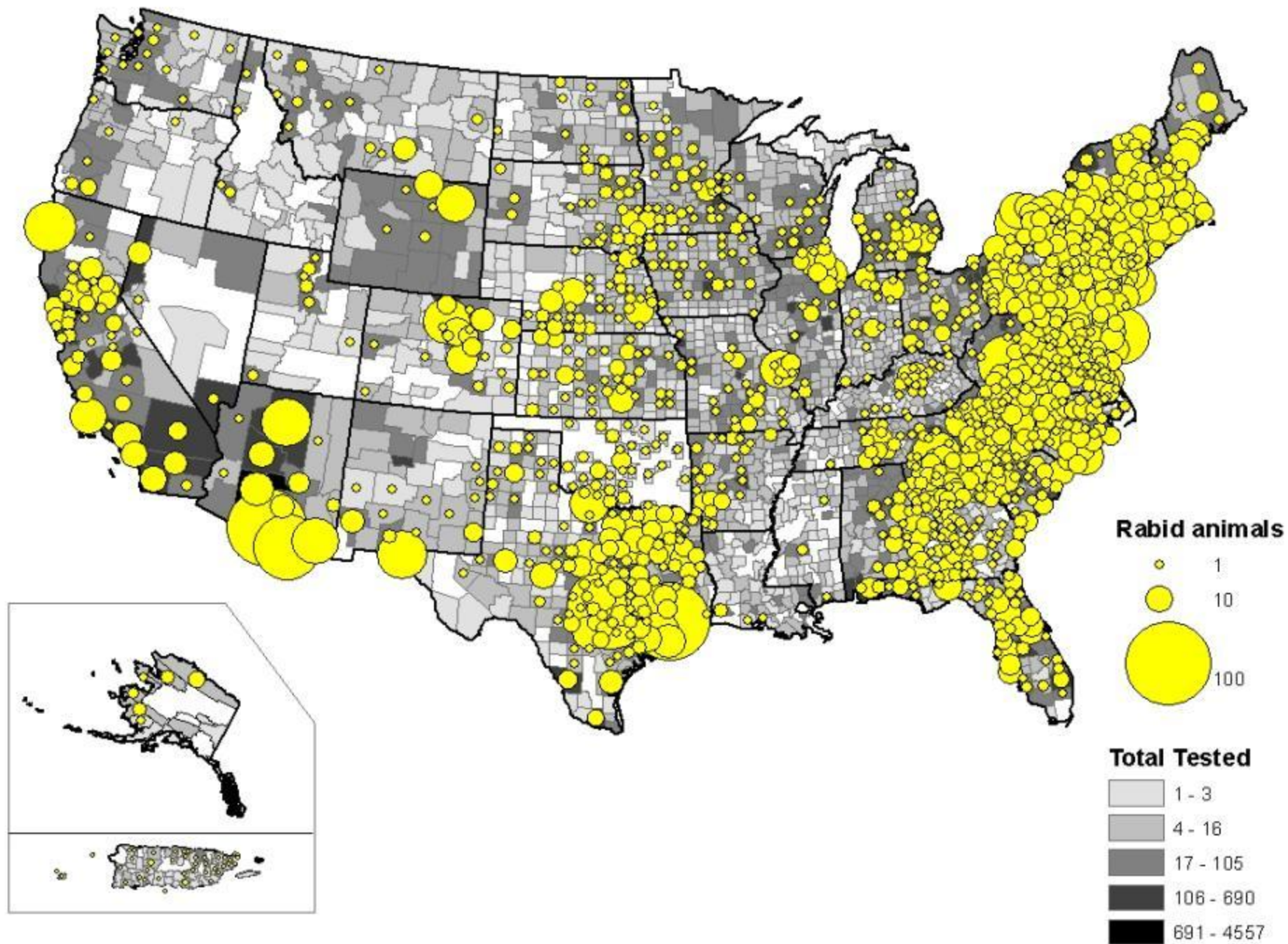
Rabies in Indiana

Rabies Virus Variants - 2009





Source: Centers for Disease Control and Prevention, November 2010



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Summary Of Human Rabies Since 1990, U.S.

- Bats are usually the source
- Evidence points to in-apparent bites from bats being a mode of transmission
- Bites not always recognized or reported
- Rabies is not always suspected by medical personnel when clinical signs develop

Human Rabies Cases

- Between 1900 and 1949 – 120 cases
- From 1950 – 10 cases
- After 1959 – 2 cases
 - 2006
 - 2009

Human Cases in the US

- 45 Cases in US Residents (1995-2010)
 - 30 positive for bat variant
 - 8 exposed to canine variant (foreign origin)
 - 4 organ/tissue transplantations (bat)
 - 3 unusual exposures
 - 1 Raccoon variant (US)
 - 1 Mongoose variant (PR)
 - 1 Fox bite (Mexico)



Incidence in Animals (IN)

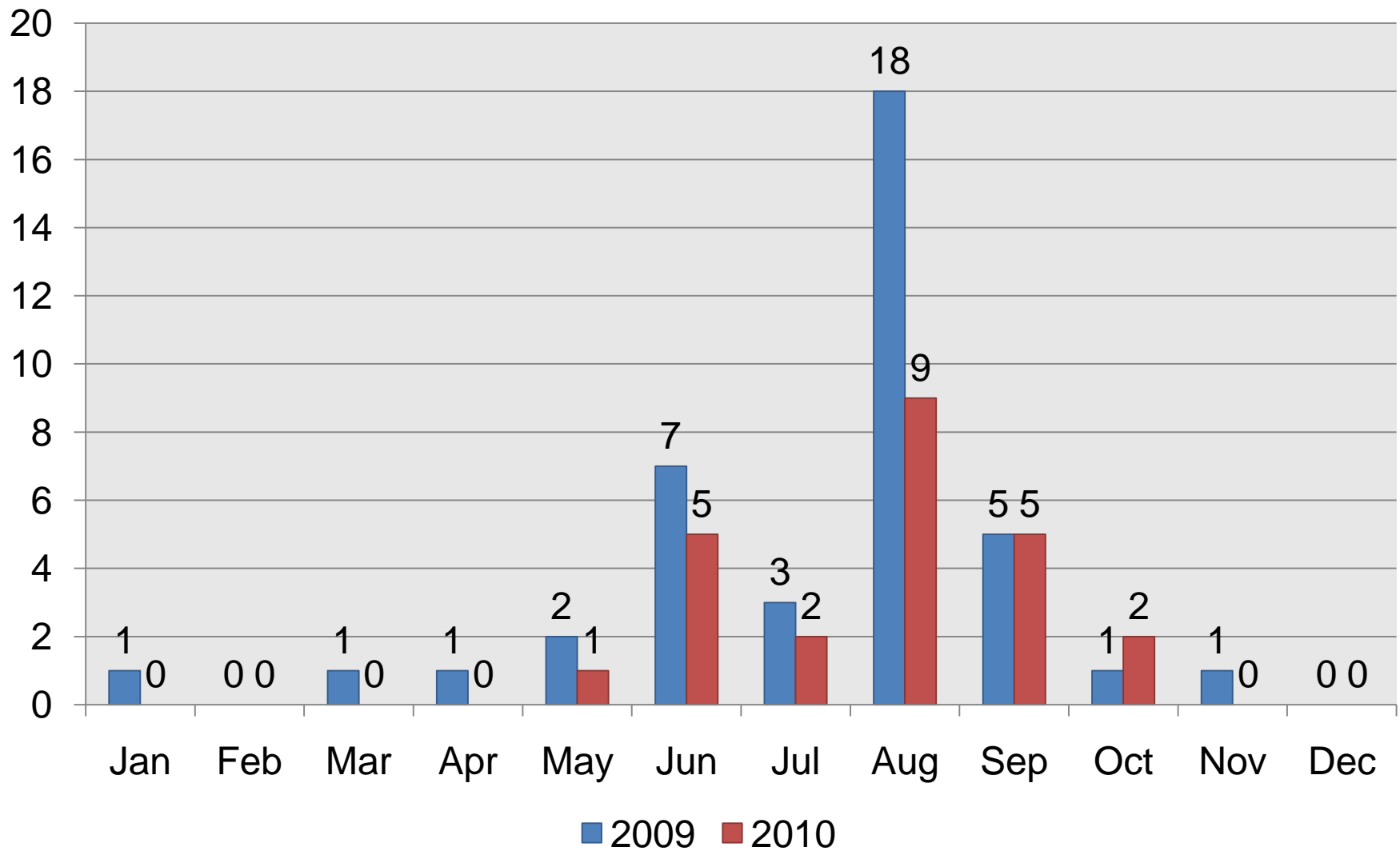
- Bat variant is endemic
 - 24 positive bats in 2010
 - Majority of human cases in the US are this variant
- Skunk variant appears occasionally
- Other variants are not currently present, but may be introduced at anytime



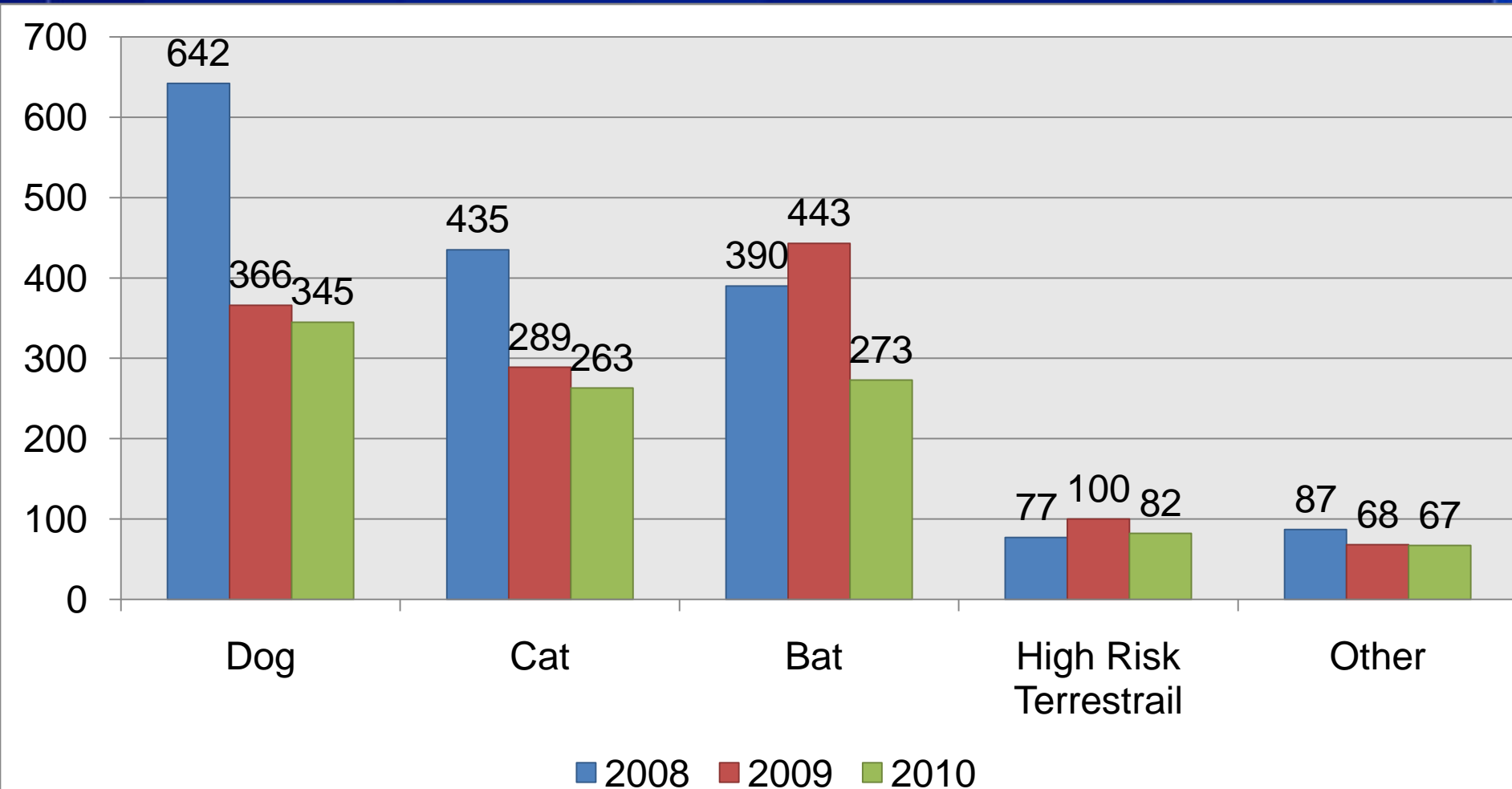
Rabies in Animals, Indiana 2000 - 2010

Year	Bat	Horse	Skunk	Human
2000	15			
2001	15			
2002	31	1	1	
2003	31			
2004	11		1	
2005	11			
2006	11			1
2007	13			
2008	11			
2009	39			1
2010	24			

Indiana Positive Bats



Rabies Submissions to ISDH



Rabies Positive Submissions

Species	Year	Species	Year
Dog	1989	Cat	1984
<i>Horse</i>	<i>2002</i>	<i>Skunk</i>	<i>2004</i>
Fox	1990	Cow	1986
Pig	1967	Ground Hog	1983
Raccoon	1979	<i>Bat</i>	<i>2010</i>
Goat	1967	Mouse	1970
Opossum	1968	Human	2006, 2009

Laws and Regulations

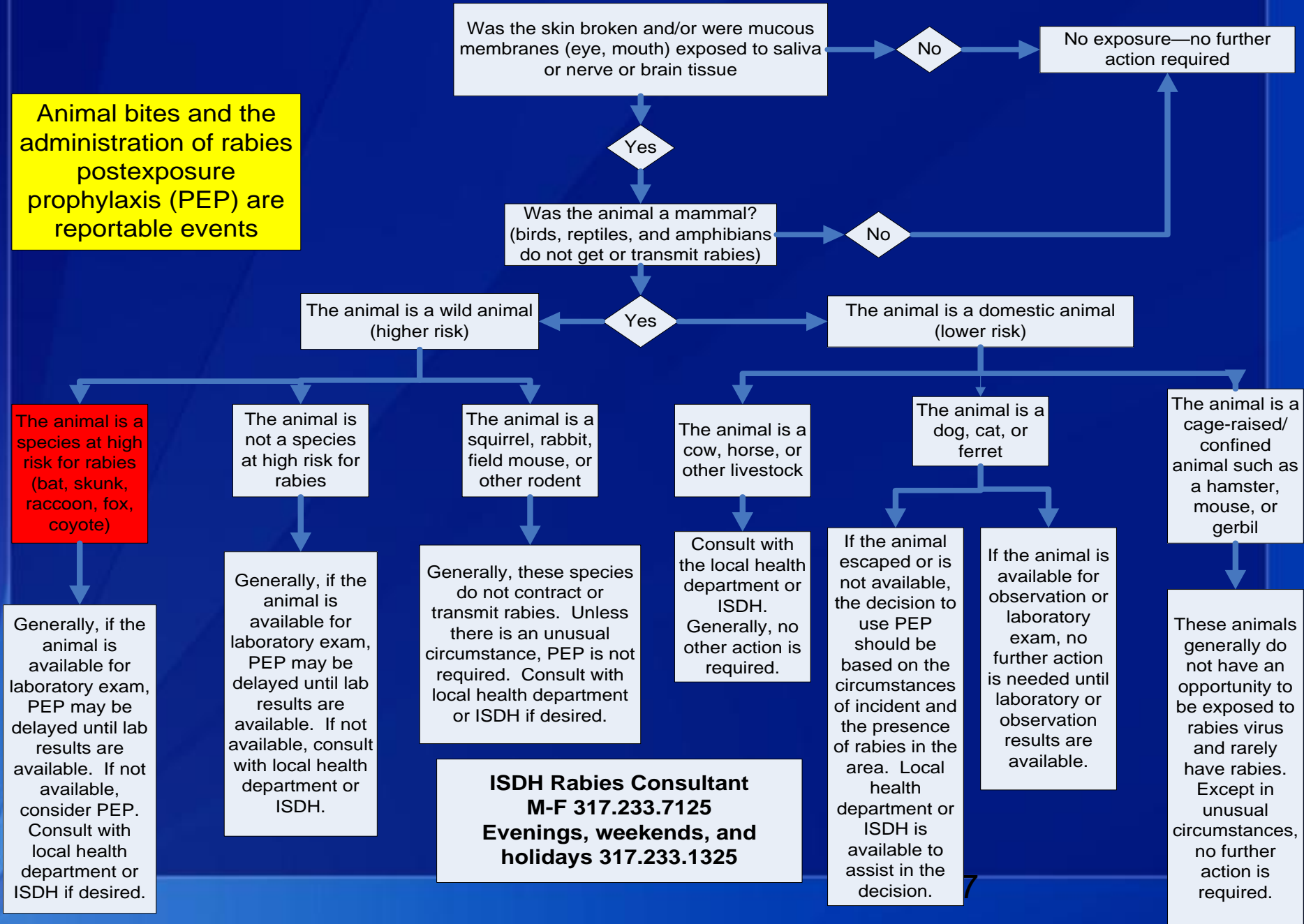
- Management of Animal Bites to Humans
 - **410 IAC 1-2.3**
- Animal bites; specific control measures
 - **Section 52**
- Authority: IC 16-41-2-1
Affected: IC 15-17-6-11; IC 16-41-2; IC 16-41-9

RABIES POST EXPOSURE TREATMENT RECOMMENDATIONS

Rabies Treatment Algorithm

This chart applies only to Indiana and to the current rabies situation (2/27/08)

Animal bites and the administration of rabies postexposure prophylaxis (PEP) are reportable events



Bite Treatment

- Clean wound immediately and thoroughly with soap and water
- Use a virucidal agent if available
- Trained medical professional should evaluate the need for antibiotics

When should post-exposure prophylaxis be started

- Depends on risk of transmission
- Usually it is ok to wait for the test results
- Urgent but not emergency

When to use Prophylaxis

- When animal tests **positive** for rabies
- When animal is a high risk animal that is **NOT available** for testing
 - Bats
 - Skunks
 - Raccoons
 - Coyotes
 - Foxes

When NOT to use Prophylaxis

- When the biter is NOT a mammal
- Low risk species with normal behavior
 - Squirrels, rodents, rabbits, etc.
- Domestic animal that is known to be alive and can be quarantined (or already is)
- When animal is available for testing
 - ISDH has a short turn around time and can normally have results within 24 hours of delivery

Prophylaxis Window

- Delay the decision for PEP if animal is quarantined or available for testing
- ISDH recommends that Rabies PEP be started within 3-7 days if the animal is a high risk species that cannot be tested
- Incubation period for development of rabies symptoms is normally 3 to 12 weeks after exposure

Rabies Prevention Guidance

- Human : Human Rabies Prevention-United States, 2008 Recommendations of Practices (ACIP)
 - MMWR: May 23, 2008 / 57 (RR-03);1 – 28
 - MMWR Update: March 19, 2010 / 59(02);1-9
- Animal : Compendium of Animal Rabies Prevention and Control, 2008 (NASPHV)
 - <http://www.nasphv.org/Documents/RabiesCompendium.pdf>

Post-Exposure Prophylaxis

- Rabies immune globulin (9 IU/lb) infiltrated into and around the wound. If not physically possible, give the remainder IM in a site away from the wound.
- Four 1 ml. doses of vaccine given intramuscularly in the deltoid area on days 0, 3, 7, and 14.

Summary, Rabies in Indiana

- Indiana's primary rabies reservoir is bats
 - Statewide
- Indiana's secondary rabies reservoir is skunks
 - Primarily in Southern Indiana, potentially statewide
- Both dogs and cats need rabies vaccination to prevent transmission from reservoirs
- Human exposures to bites/saliva from wildlife and domestic animals must continue to be evaluated for the potential that rabies virus may have been transmitted from offending animal

Questions?



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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of Indiana State Department of Health